Exercise 1 (20 points)
A student won a University prize. He will receive a check for SR 27978 now and a similar one at the beginning of each year for the next 4 years. To provide all these payments, the University purchased an annuity at 5% compounded annually. How much did the annuity cost the university? (2 decimal places)

Exercise 2 (20 points)
A coin is tossed 27 times, the resulting sequence of heads (H) and tails (T) is recorded. How many sequences have at most 3 heads?

Exercise 3 (20 points)
A fair coin and fair die are tossed. Find the probability that:
(a) a tail and a 6 show.

(b) a tail and an odd number show.
Exercise 4 (20 points)
Urn I contains 1 red and 2 black marbles. Urn II contains 1 pink and 1 red marbles. An urn is selected at random. Then a marble is randomly drawn from it and placed in the other urn from which we randomly draw a marble.
(a) Set the tree diagram with the corresponding probabilities

(b) Find the probability that the second draw yields a red marble. (3 decimal places)

Exercise 5 (20 points)
A first card is drawn from a deck of 52 cards. A second card is then drawn.
Let E = \{Second card is a spade\} and F = \{First card is a heart\}.
(a) Set the tree diagram with the corresponding probabilities

(b) Are E and F independent?